

On the Welfarist Rationale for Relative Poverty Lines

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Abstract

The theory and evidence supporting a relativist approach to poverty measurement are critically reviewed. Various sources of welfare interdependence are identified, including the idea of “relative deprivation” as well other (positive and negative) welfare effects for poor people of belonging to a better-off group. An economic model combines informal risk sharing with the idea of a “positional good,” and conditions are derived in which the relative deprivation effect dominates, implying a

relative poverty measure. The paper then reviews the problems encountered in testing for welfare effects of relative deprivation and discusses the implications of micro evidence from Malawi. The results are consistent with the emphasis given to absolute level of living in development policy discussions. However, relative deprivation is still evident in the data from this poor but unequal country, and it is likely to become a more important factor as the country develops.

This paper—a product of the Director's Office, Development Research Group—is part of a larger effort in the department to illuminate the conceptual and empirical foundations for poverty measurement practices in the World Bank.. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The author may be contacted at mravallion@worldbank.org.

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On the Welfarist Rationale for Relative Poverty Lines

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1. Introduction

The most common practice for measuring poverty in developing countries aims to set absolute poverty lines, meaning that they have constant purchasing power over commodities. The cost-of-living indices used for this purpose are typically based on the prices observed at each date or location (urban versus rural areas, region or country), with an allowance for spending on those goods (notably non-food items) for which price data are missing. A poverty measure, such as the headcount index or poverty gap index, is then calculated by deflating actual consumptions or incomes at household level by these poverty lines, which can also be used to adjust for differences in household size and demographic composition. Such measures have become important tools for assessing development progress and guiding policy making.

What are the conceptual foundations of this practice? On reflection, two axioms are crucial, and neither is uncontroversial. The first is the subgroup additivity axiom, meaning that aggregate poverty is the sum of all individual levels of poverty in the population. This has long been considered a desirable feature of a poverty measure. It implies that if poverty increases in any subgroup of the population, and does not change for any other group, then aggregate poverty must increase; this is the “subgroup monotonicity axiom” of Foster and Shorrocks (1991). The practice of poverty measurement has largely been confined to additive measures.²

Additivity is not universally accepted. Foster and Sen (1997) argue in favor of non-additive functional forms as a means of bringing relativist considerations into poverty measurement; an example is the Sen (1976) measure, based on weights that reflect rank order in the income distribution. But even such non-additive measures need not reflect poor peoples’ perceptions of relative deprivation. A simple example will suffice to see why. Consider a society divided into “rich” and “poor,” with incomes y^r and y^p , and a fixed poverty line $z \in (y^p, y^r)$. Suppose that poor people experience relative deprivation in that higher y^r makes them worse off at given y^p . Such an increase in y^r will leave measured poverty unchanged, whether one uses the (non-additive) Sen index or any of the many additive measures.

The second axiom has received less attention in the poverty-measurement literature, but is arguably more contentious. This says that moving a person between groups, with no absolute

² Examples include the widely used Foster-Greer-Thorbecke (1984) class of measures. Atkinson (1987) reviews other measures in the broad class of additive measures.

loss in her own real consumption, cannot increase aggregate poverty. I call this the subgroup anonymity axiom. In combination with additivity, this implies that we should use poverty lines that have a constant real value across subgroups.³

Anonymity rules out the possibility that a person's poverty depends not just on her own consumption, but is also directly impacted by the consumptions of others in some reference group. In other words, it rules out the idea of a "relative poverty line," which is an increasing function of the levels of mean consumption (or income) of the region or country.⁴ Subgroup anonymity is thus a crucial assumption justifying current practices in setting poverty lines.

This paper critically explores the arguments and evidence for the anonymity axiom. The following section reviews the conceptual foundations of poverty measurement and the sources of interdependence, including the idea of "relative deprivation" (RD), but also recognizing that there are both positive and negative welfare effects for poor people of belonging to a better-off group. Section 3 asks when RD will be the dominant source of interdependence in a simple economic model combining informal risk sharing with the idea of a "positional good." Section 4 turns to the problems of testing for RD, while section 5 presents some micro evidence on the issue, for one of the poorest countries, Malawi. Section 6 offers some overall conclusions.

2. Conceptual foundations for relativism

Real income comparisons have long been anchored to some underlying absolute space. Economists have traditionally seen "utility" or "welfare" (in most usages they are the same thing) as the relevant absolute space. For example, a "true cost of living index" is defined as the monetary cost in a specific setting (data or place) of a fixed reference utility level relative to its cost at some reference setting (see, for example, Deaton and Muellbauer, 1980). A monetary poverty line can be interpreted as the minimum cost of not being deemed absolutely poor in the utility space (Blackorby and Donaldson, 1987).

³ To see why, let aggregate poverty be $P = \sum p(y_i, z_i)$ where y_i is the real income of person i , and z_i is the (real) poverty line of the group to which i belongs; the function p is strictly decreasing in y and increasing in z . Subgroup anonymity entails that P is unchanged when group assignment changes, without any change in the y 's, the poverty line for person k is simply replaced by that of group, $j \neq k$. Given the monotonicity of p in z , it is evident that the only way this is possible is that $z_i = z$ for all i .

⁴ This is clearly the most important way that relativist considerations enter poverty measurement, but it not the only way; for an overview of the concepts found in the literature see Foster (1998).

There is scope for debate about what the absolute space should be. Sen has argued that “capabilities” should be seen as absolute rather than utility or commodities; in the context of poverty measurement, this means that “...an absolute approach in the space of capabilities translates into a relative approach in the space of commodities” (Sen, 1983, p. 168).

These two views on the relevant absolute space are not inconsistent; indeed, one can reconcile them by assuming that utility is an interpersonally stable function of capabilities; absolute minima in the latter space can then be transformed into a common utility poverty line (Ravallion, 2006). On *a priori* grounds it would seem far easier to accept that there is a stable function common to all people relating welfare to capabilities than it is to accept that there is such a function defined solely on the commodities consumed. As Sen and others have argued persuasively, the utility value of a given set of commodities must be highly dependent on individual circumstances—a source of heterogeneity that creates much trouble for mainstream approaches to welfare measurement in economics, as discussed further below.

An absolute poverty line in terms of welfare or capabilities does not require that the income poverty line is invariant to context, such as the region or country where a person lives. Indeed, relative poverty lines that rise with mean income are implied whenever levels of welfare (or capabilities) depend on relative consumption. This is consistent with the large body of work that has argued that relative economic position is the carrier of welfare, not absolute income or consumption. This is often called the theory of relative deprivation, following Runciman (1966).⁵ The importance of RD has long been debated in economics, although early discussions had little or no empirical evidence to draw upon.⁶ In more recent times, we have seen mounting evidence of RD effects from a variety of sources, though almost solely for developed countries.⁷

The issue of how much RD matters to poor people is of the utmost importance to policy discussions about how to fight poverty. If welfare depends on both own consumption and consumption relative to the mean of one’s country (say) then a welfare-consistent poverty line would be a relative line, rising with mean consumption. For example, poverty lines in Western

⁵ There is a large literature; other contributions include Easterlin (1974, 1995), Townsend (1979), van de Stadt et al., (1985), Frank (1997), Oswald (1997), Solnick and Hemenway (1998), Walker and Smith (2001) and Alpizar et al. (2005).

⁶ See, for example, Becker’s (1974) discussion of the differing views of Adam Smith and Thorstein Veblen concerning (in effect) the welfare relevance of RD.

⁷ Easterlin (1974) used RD to explain why the proportion of people who think they are happy has not changed much over time in the US, despite economic growth. Also see Oswald (1997), Frank (1997) and Blanchflower and Oswald (2004).

Europe have been set at a constant proportion of average income (strictly the median).⁸ RD effects in poor countries as strong as those claimed for rich ones would cast serious doubt on the justification for many current development policies, notably the emphasis currently placed on promoting economic growth in poor countries. Negative externalities in consumption from RD would also suggest that poor people face inefficiently high incentives to escape poverty, because they do not take account of the negative spillover effects of their income gains on social comparators. By this view, promoting poverty reduction would entail welfare efficiency costs—pointing to a potentially important trade-off for development policy.

However, while RD postulates a negative external effect on welfare of the poor from an economic gain to the relevant reference group, other theories and evidence point instead to positive external effects. The uninsured risks facing poor people, and the scope for falling into permanent destitution, are known to foster various arrangements for mutual support and risk sharing.⁹ Local communities have been seen to play an important role in these and other sources of positive external effects, such as through employment and local public goods.¹⁰

The pace of urbanization in a developing country could also be expected to play an important role in the balance of positive and negative external effects. . It can be conjectured that community-based risk sharing and collective action erodes with urbanization; the repeated interactions amongst essentially the same group of people that sustain informal risk-sharing arrangements are clearly more common in village-based societies than urban areas with more mobile populations.¹¹ Perceptions of RD, on the other hand, may well be stronger in urban areas.

If the positive externalities are the dominant social effect, with RD playing at best a secondary role, then welfare-consistent relative-poverty measurement would take a radically different form to (say) the standard methods found in the developed-country literature: the income poverty line would fall as mean income of the reference group rose.

⁸ This has been a common practice in Western Europe. Although the US government has traditionally used absolute poverty lines, there have been proposals to introduce relative poverty lines; see Citro and Michael (1995) and Betson et al. (2000).

⁹ There is a large literature, including Ravallion and Dearden (1988), Murgai et al. (2002), Ligon et al., (2002), Fafchamps and Lund (2003), Maitra and Ray (2003) and Cox et al. (2004).

¹⁰ For an interesting perspective on the role of communities see Bowles and Gintis (2002). In a development context, see Mansuri and Rao (2004). Jalan and Ravallion (2002) find evidence of positive externalities for poor rural households living in areas with better-off neighbors (in southwest China).

¹¹ For supportive evidence see Ravallion and Dearden (1988) (using data for Java, Indonesia).

To address this issue, and bring relativist considerations into poverty measurement in a scientifically credible way, one first needs to say how “welfare” is to be measured. The tradition in economics has been to try to infer welfare from demand behavior. This approach has met some severe identification problems, which render it impossible to infer utility from observed consumer demand behavior amongst heterogeneous households without some rather strong assumptions; see, for example, Pollak (1991) and Browning (1993). Even using high quality surveys (in which an income aggregate is built up from many detailed questions), current incomes are unlikely to reflect well either past or expected future incomes, which are likely to matter to current welfare. Expenditure on current consumption may do a better job in this respect, but will still be an imperfect welfare indicator given that inter-temporal markets do not work perfectly. There are also uncertainties about how best to normalize for heterogeneity in consumption needs, such as stemming from demographic differences between households.

In this light, Sen’s advocacy of a capabilities foundation for poverty measurement can be seen as a means of addressing the identification problem, by broadening the information base for assessing welfare. One strand of the poverty measurement literature has used approaches that anchor poverty lines in the income space to attainments of certain basic functionings, notably being sufficiently well-nourished to maintain good health and normative activity levels.¹² Here too the measurement problems are far from trivial, such as in measuring nutritional attainments and setting normative activity levels. There is some evidence that, in practice, these methods generate poverty lines with similar properties to relative poverty lines, in which the poverty line is roughly proportional to mean income of the area of residence (Ravallion and Bidani, 1994).

However, there is a risk of anchoring poverty lines to a partial sub-set of the capabilities that matter to welfare. Nutritional requirements are an example. The high income elasticity that is found for poverty lines anchored to attaining nutritional requirements alone can arise from factors that one might well deem to be irrelevant to welfare. For example, tastes often shift to more expensive sources of food energy as real incomes rise with urbanization; shifts in relative prices can also play an important role in this change in consumer behavior as economies develop. The resulting poverty comparisons can then be welfare-inconsistent (Ravallion, 1994; 1998).

A potentially important source of information for identifying a more comprehensive welfare metric for anchoring poverty lines is subjective assessments of well-being. In one

¹² A critical review of these approaches can be found in Ravallion (1994).

method, survey respondents provide their perceived minimum income for attaining certain subjective-qualitative levels of living (Van Praag, 1968; Danziger, et al., 1984; Kapteyn et al., 1988). The “consumption adequacy” question of Pradhan and Ravallion (2000) is an alternative approach with advantages when “income” is not well-defined. More general “subjective well-being” questions have also been used; probably the most common example is the satisfaction with life (SWL) question.¹³

The role of such subjective welfare data is not to decide who is better off, but to identify the parameters of an objective welfare metric. SWL is assumed to depend on true objective welfare plus other extraneous factors such as personality traits, “mood effects” and so on. Econometric methods are then used to extract the signal on how objective welfare varies with relevant covariates (see, for example, Kapteyn, 1994, and Ravallion and Lokshin, 2002).

A body of research along these lines has suggested that there are RD effects on welfare. Past econometric tests have regressed self-rated welfare (satisfaction with life or happiness) on both own income and an estimate of comparison group income, which is typically the mean income of people living in the same area or working in the same industry or with similar characteristics (age, education, occupation).¹⁴

Such studies have suggested that welfare-consistent poverty lines would need to have a high income elasticity in developed countries. In a recent example, Luttmer (2005) regressed self-assessed happiness in the US on log income and log mean ‘neighbors’ income, and found that the two coefficients add up to roughly zero, implying that an equal proportionate increase in all incomes (leaving relative inequality unchanged) would have no impact on average happiness. This suggests a welfarist justification for setting the poverty line at a constant proportion of mean income. An equi-proportional increase in all incomes would then leave most poverty measures unchanged. Other studies for developed countries have found lower income elasticities of the poverty line than suggested by Luttmer’s results. Kilpatrick (1973) found that subjective poverty lines over time in the US have an elasticity of about 0.6 to mean income. Hagenaars and van

¹³ A common form is: “Overall, how satisfied (content, happy) are you with your life? Are you (1) very unsatisfied; (2) unsatisfied; (3) neither unsatisfied nor satisfied; (4) satisfied; (5) very satisfied?”

¹⁴ Examples include Stadt et al. (1985), Clark and Oswald (1996), Pradhan and Ravallion (2000), Ravallion and Lokshin (2002), McBride (2001), Blanchflower and Oswald (2004), Senik (2004), Kingdon and Knight (2004), Ferrer-i-Carbonell (2005) and Luttmer (2005).

Praag (1985) found an elasticity of about 0.5, using data for eight European countries. But all these studies suggest that the elasticity is appreciably greater than zero.

The use of subjective questions in welfare assessment has been controversial in economics. Sen has criticized the use of subjective assessments of capabilities, notably health; see, for example, Sen (1998). A number of studies have emphasized the potential for reporting biases in self-assessed health.¹⁵ Though less well researched, similar problems arise in self-assessments of overall welfare. Under certain conditions, it is possible to extract a more reliable signal on welfare effects from such data using multiple observations over time for the same person to purge the data of latent idiosyncratic personality traits (Ravallion and Lokshin, 2001). Subjective data help solve some of the fundamental identification problems in measuring welfare, but they bring their own problems as well.

3. An encompassing theoretical model

It is assumed that individual utility depends on both own-income and the mean income of a reference group of (say) “neighbors.” (In the most general formulation utility depends on the complete vector of incomes.) Relative deprivation theories essentially say that utility is increasing in own income but decreasing in the mean of the reference group. However, other sources of economic interdependence suggest that there may be countervailing and strong positive forces on welfare stemming from more affluent neighbors. This section begins with a reasonably general “reduced form” model of a relative poverty line, and then outlines a simple theoretical “structural form” model in which both the positive and negative forces co-exist. This allows us to explore the conditions under which RD emerges as the dominant concern.

3.1 A general formulation of a utility-consistent relative poverty line

To capture the idea of RD in a simple way, we can postulate a standard (cardinal and inter-personally comparable) utility function for a person with income y and other welfare-relevant characteristics x , with the difference that the function also varies with relative income, $r = y/m$ where m is mean income in an appropriate reference population, such as the fellow citizens of the country in which the person lives.¹⁶ The utility function is:

¹⁵ See, for example, Butler, et al. (1987), Groot (2000) and Lokshin and Ravallion (2008).

¹⁶ If one defines m as average expenditure on certain “basic goods” then the following argument will generate the type of poverty line proposed by Citro and Michael (1995), though it need not have an

$$u = v(y, r, x) \quad (1)$$

This is smoothly increasing in y and r . The fixed poverty line in utility space is:

$$z_u = v(z, z/m, x) \quad (2)$$

where z is the poverty line in income space. Equation (2) defines implicitly the function:

$$z = z(m, x, z_u) \quad (3)$$

This shows how the poverty line for “type x ” people varies with the m , to keep utility constant.

Let η denote the elasticity of the monetary poverty line with respect to the mean, we find that:

$$\eta \equiv \frac{\partial \ln z}{\partial \ln m} = \frac{1}{1 + mMRS} \quad (4)$$

where MRS is the marginal rate of substitution between y and r (i.e., $MRS = (\partial v / \partial y) / (\partial v / \partial r)$). The value of η will be somewhere between zero and one. This prediction is confirmed by a number of empirical studies of both objective and subjective poverty lines.¹⁷

Thus we can rationalize theoretically the notion of a poverty line that is absolute in the welfare space, but relative in the income space, as discussed in the previous section. But where does the direct interdependence embodied in (1) come from? And why is it necessarily a negative external effect (whereby having a better-off reference group lowers welfare)? And where is the evidence that it exists? The rest of this essay will take up these issues.

3.2 *An expository structural model of the sources of interdependence*

The above formulation is too general to provide any insights into the competing (positive and negative) sources of interdependence, and it is only then that we can try to understand why one might find an interaction effect between concerns about RD and one’s own level of living. However, it must be acknowledged that there are many possible sources of interdependence, particularly in a developing country context. The following model pits two stylized sources against each other: interdependence arising from the existence of positional goods and interdependence arising from informal risk-sharing arrangements.

I assume that an informal risk-sharing arrangement exists amongst a set of self-interested individuals and I consider two homogeneous groups, one of which draws the income y while the

elasticity of one to m , as assumed by Citro and Michael. But it is unclear why perceptions of RD would exclude certain goods, and particularly “non-basic” goods; this assumption would seem hard to defend.

¹⁷ Ravallion (1998) provides evidence consistent with this property based on cross-country comparisons of how the poverty lines used in practice vary with mean consumption. The analyses of subjective poverty lines for the US by Kilpatrick (1973) and for European countries by Hagenaars and van Praag (1985) are also consistent with this prediction.

other gets y^n (which we can think of as the ‘neighbors’). The risk-sharing arrangement is in place prior to the realization of an uncertain process that assigns people to these groups at each date. The incomes are random variables, reflecting the risks faced in a (largely rural) developing economy.

To derive $v(y, y^n)$, let utility depend on the quantities consumed of two commodities, X_1 and X_2 . (To simplify notation I treat individuals as homogeneous in other respects.) Utility from X_1 depends on one’s own consumption, but for X_2 it depends on consumption relative to the other group, making it a ‘positional good.’ One can think of X_1 as a good that is consumed in private while the consumption of X_2 is public knowledge within the community and so it gives status in the specific social context, leading to consumption rivalries.

Utility is $u(X_1, X_2 - X_2^n)$ when neighbors consume X_2^n of the positional good.¹⁸ Utility is strictly increasing and quasi-concave and the budget constraint is:

$$X_1 + pX_2 = y + \tau(y, y^n) = Y \quad (5)$$

where $\tau(y, y^n)$ is the monetary value of the support (in cash or kind) received by a person with pre-transfer income y in $[y^{\min}, y^{\max}]$ when the neighbors have the pre-transfer income y^n . (I use lower case y to denote pre-transfer income and upper case Y for post-transfer and similarly for y^n and Y^n .) I assume that $\tau(y, y^n) > 0$ if $y < y^n$ and $\tau(y, y^n) + \tau(y^n, y) = 0$.

The function τ is decided prior to knowing the actual state-specific incomes. The folk theorem can be used to motivate the risk-sharing arrangement as the outcome of a repeated non-cooperative game in which defectors are penalized by being excluded from the game for ever after. Full risk sharing (income-pooling) requires that $\tau(y, y^n) = y^n - y$, so that everyone ends up with y^n .¹⁹ However, to be feasible, the transfers must satisfy the constraint that the gain from continued participation in the risk-sharing arrangement is no less than the gain from defection. When full-risk sharing is not attainable, the equilibrium $\tau(y, y^n)$ is the maximum amount that

¹⁸ Notice that I am assuming that it is the difference $X_2 - X_2^n$ that matters not the ratio X_2 / X_2^n . That is not essential, though it simplifies the analytics.

¹⁹ The property can be relaxed to allow post-transfer income inequality with full risk sharing by introducing a risk-free idiosyncratic income component.

can be taken from the person with higher realized income without inducing defection, given the cost of that defection (Coate and Ravallion, 1993).²⁰

There are other possible interpretations of $\tau(y, y^n)$. The positive externality of a higher y^n might arise instead from the financing arrangements for a local public good, the quantity of which is subsumed in the direct utility function u . Then $\tau(y, y^n)(< 0)$ can be thought of as the charge levied on those who draw the income y in a community with mean income y^n .

The implied demand functions are $X_i[y + \tau(y, y^n), X_2^n, p]$ ($i=1,2$) and the corresponding demand functions for the neighbors are $X_i[y^n - \tau(y, y^n), X_2, p]$. I assume that these functions are non-decreasing in incomes, implying marginal propensities to spend that are non-negative and bounded above by unity for both goods and both groups. The indirect utility function is:

$$v(y, y^n) \equiv \tilde{v}[y + \tau(y, y^n), X_2^n, p] = \max[u(X_1, X_2 - X_2^n) | X_1 + pX_2 = y + \tau(y, y^n)] \quad (6)$$

(The corresponding utility function for the neighbors is $v(y^n, y)$.) It can be shown that:²¹

$$\text{sign} \frac{\partial v}{\partial y^n} = \text{sign} \left[\frac{\partial \tau}{\partial y^n} - p \frac{\partial X_2^n}{\partial Y^n} \left(1 + p \frac{\partial X_2^n}{\partial Y^n} \right)^{-1} \right] \quad (7)$$

This captures the two opposing effects of an increase in neighbor's income: the gain from higher transfer receipts ($\partial \tau / \partial y^n > 0$) versus enhanced relative deprivation ($\partial X_2^n / \partial Y^n > 0$).

Three special cases are instructive about the range of possible outcomes.

Case 1: Full risk sharing. It is plain from (7) that the positive effect will always dominate the RD effect under full risk sharing. Then $\partial v / \partial y^n > 0$, given that $\partial \tau / \partial y^n = 1$ and

$p \partial X_2^n / \partial Y^n \geq 0$ ($p \partial X_2^n / \partial Y^n > -1$ is all that is strictly required). With full risk sharing, RD

cannot be the dominant social effect in this model at any income level.

²⁰ Coate and Ravallion derive $\tau(y, y^n)$ as the solution to a repeated noncooperative game in which each player faces an independent and uncertain income stream with (y, y^n) as the possible draws. They characterize the solution for the case in which utility depends on own income, and compare this to the optimal insurance scheme. Extending their analysis to the present situation of externalities is not difficult; the simplest approach would assume that utility is separable between own income and neighbor's income.

²¹ The following result is proved by applying the envelope theorem to (6), then using the first-order condition for X_2 , and then solving further using the income derivative of the demand function for X_2^n .

Case 2: Partial risk sharing with small transfers: With partial risk sharing, the equilibrium transfer is the maximum that can be sustained without inducing the donor's defection, i.e., $\tau(y, y^n)$ is defined implicitly by equating the donor's benefit from defection with the utility-cost of defecting, c :²²

$$v(y^n, y) - v[y^n - \tau(y, y^n), y] = c \quad (\text{for } y^n > y) \quad (8)$$

I can treat c as fixed, implying that:

$$\frac{\partial \tau}{\partial y^n} = 1 - \frac{\partial v(y^n, y) / \partial y^n}{\partial v(y^n - \tau, y) / \partial y^n} \quad (9)$$

It is clear from (9) that for small transfers, the maximum possible τ without inducing defection is unresponsive to changes in y^n . Setting $\partial \tau / \partial y^n = 0$ in (7) it is evident that when efficient risk sharing is not feasible and transfers are small, RD will dominate ($\partial v / \partial y^n < 0$).

Between these extreme cases, stronger assumptions are needed to determine the direction of the welfare effect with large transfers that fall short of full risk sharing. Nor can it be presumed that the external effect will have the same sign whatever the level of own-income. This is illustrated by the following case.

Case 3: Partial risk sharing, non-negligible transfers and an interaction effect. In this case, the positive externality dominates for the poor, but this switches at sufficiently high incomes, when RD becomes the dominant social effect. To see how this can happen, notice first that (from equation 7), there are two ways that differences in own-income y could affect the balance between the two opposing external effects. The first is through an interaction effect between own income and neighbors' income in the transfer function and the second is through any own-income effect on neighbors' marginal propensity to consume the positional good. Let us close off the first effect by assuming that the utility function is separable between y and y^n , so that the marginal propensity to transfer, $1 > \partial \tau / \partial y^n > 0$, does not depend on y . The first term on the RHS of (7) is thus a constant. Focusing on the second term in (7), Case 3 assumes that the marginal propensity to consume the positional good is very low at low incomes. The idea here is that when both incomes are very low, social rivalries are likely to be dominated by the

²² Note that $v(y^n, y)$ is the neighbor's utility and recall that $\tau(y, y^n) + \tau(y^n, y) = 0$.

attainment of basic needs for survival.²³ So one can set $p\partial X_2^n / \partial Y^n$ sufficiently close to zero at y^{\min} such that $\partial v / \partial y^n > 0$. At higher incomes, the social aspect of the positional good starts to influence budget allocations; in particular, I assume that the neighbor's marginal propensity to spend on the positional good rises to near unity at y^{\max} (the boundary condition can be relaxed without changing the result). Then $\partial v / \partial y^n < 0$ at $y = y^{\max}$. By continuity there will be a unique switch point in the income space, below which $\partial v / \partial y^n > 0$ and above which $\partial v / \partial y^n < 0$.

We will see later that some new micro evidence on RD in a poor country points to the existence of just such an interaction effect between “own income” and the marginal welfare impacts of having better off friends and neighbors.

4. Pitfalls in testing for relative deprivation

As was noted in Section 2, the literature has reported evidence of RD effects in subjective welfare data. However, there are reasons to suspect that past tests are biased toward finding signs of RD when it is not in fact present.

One source of bias is that the mean income of neighbors—strictly it is typically the mean income of survey respondents in a geographic area that includes the respondent—is picking up a spatial autocorrelation in income measurement errors. Such spurious social effects would appear to be a common problem in past tests for relative deprivation. Ravallion and Lokshin (2007) attempt to solve the problem by using a better measure of own-economic welfare than income, where “better” is judged from the point of view of predicting subjectively assessed welfare. The obvious place to look is the respondent's own perception of economic welfare, which will automatically reflect geographic factors with direct bearing on economic wellbeing.

A less familiar source of spurious RD effects is that different people are likely to attach different meanings to the categories used in satisfaction or happiness questions.²⁴ People answer such questions relative to their personal frame-of-reference (FOR), which depends on their own knowledge and experience. And this is likely to be correlated with characteristics of where they

²³ One does not need a kink in the demand functions, which can still be continuous with continuous first derivatives. All one requires is that the income gradient is sufficiently low at low incomes.

²⁴ This is an instance of what is called differential item functioning (DIF) in the literature on educational testing where DIF exists if students with equal latent ability have different probabilities of giving a correct answer; for an overview of the history and methods of addressing DIF see Angoff (1993).

live, including mean income. It would seem reasonable to assume that people living in poor areas tend to have more limited knowledge and experience of the full range of levels of living found in the society as a whole. Someone living in a poor village who has gone no further than the county town, will undoubtedly rate her economic welfare higher than someone with the same real income living in a city, who sees far greater affluence around her.

In these circumstances, heterogeneity in the FOR will translate into corresponding differences in perceived welfare. At given objective circumstances, the person living in the poor area will have higher perceived welfare because she simply does not know that many people live better than she does. Thus the regressions used in this literature would tend to reveal a negative coefficient on neighbors' mean income, even if there is no direct social comparison effect on utility, as postulated by RD theory. The negative regression coefficient reflects the difference in knowledge, which creates a systematic difference in the scale used to assess well-being.

There is a solution to this problem. Ravallion and Lokshin (2007) show that one can reduce the bias by using the respondent's self-assessed economic welfare instead of the objective value, y , for explaining SWL, under the assumption that all subjective measures for a given respondent are subject to the same FOR effect. This is plausible since they are constrained by the same knowledge and experience.

The measurement of comparison-group welfare also poses a problem. In the standard approach in the literature, the researcher must make an *a priori* judgment about the relevant comparison group. Yet this can vary greatly from person to person. It has been argued that "... comparisons are most salient if individuals perceive the reference person or group as in some way similar to themselves" (Kahneman and Varey, 1991, p. 140). But that is based on the individual's own judgment, given idiosyncratic informational and social factors that a researcher would have a very hard time observing in any systematic way. Neither psychological nor economic theories of RD offer much insight into who constitutes the relevant comparison group. The researcher must make some potentially strong identifying assumptions.

A further concern is that differences in the objective economic welfare of one's neighbors can hardly be relevant to RD, or the security that may come from knowing that friends and neighbors are capable of coming to one's aid, unless those differences are known and perceived as relevant by the person in question. In accounting for differences in overall well-being, it can be argued that the subjective assessment is likely to matter more than the objective one, such as

mean income in the area of residence. The objective measure can be thought of as a proxy (possibly poorly measured) for the true perception of the comparison group's welfare. Assuming classical measurement errors, attenuation biases can be expected, although the errors could also be correlated with the dependent variable in this case, clouding the direction of bias.

These observations motivated Ravallion and Lokshin (2007) to take a different approach that avoids the need to pre-judge the comparison group and the precise welfare metric. They used data on the respondent's assessments of the economic welfare of the family's 'friends' and 'neighbors.' This has the advantage that it is tailor-made to the perceptions of the respondent.

This assumes that people report accurately to the interviewer on their perceptions of both their own welfare and that of their friends and neighbors. There may also be systematic (non-random) reporting biases. If RD is a source of disutility then it may well influence the answers given to interviewers. Could this undermine such tests? It is instructive to consider a simple, yet seemingly plausible, model of that bias. Suppose that utility depends on own-economic welfare and comparison-group welfare and that RD matters, but to 'save face' the respondent hides the true RD from the interview. More precisely, assume that the responses are biased in amounts that are directly proportional to the difference between (true) own welfare and that of the comparison group; if the respondent feels poorer than her comparison group then she over-states her own economic welfare and/or under-states that of her comparison group. The true parameters are then positively-weighted linear combinations of the estimated parameters based on the reported data (Ravallion and Lokshin, 2007). Even though one does not know the bias parameters, this model implies that if one finds that both own-welfare and comparison-group welfare have positive coefficients then this must also be the case for the true parameters; reporting biases cannot be hiding a true RD effect when no such effect is observed empirically.

5. Some findings from Malawi

Malawi is one of the poorest countries. Almost 90% of the population lives in rural areas, and are mostly small-holders, depending heavily on rain-fed, and risk-prone, agriculture. In the late 1990s, two-thirds of the population lived below the country's poverty line (National Economic Council, 2000). Income inequality is high, with a Gini index around 0.50 (World Bank, 2005a). As in any risk-prone and poor rural economy there are various forms of informal insurance and social assistance in rural Malawi.

Ravallion and Lokshin (2007) tested for RD effects on subjective welfare in Malawi using the 2004 round of the Malawi Integrated Household Survey (MIHS), covering a sample of over 11,000 households. MIHS collects data on consumptions of a wide range of food and non-food items, detailed information about the socio-demographic composition of the household, labor status of the household members, health, educational achievements, various sources of household income including income in-kind, and individual wages. A section of the questionnaire asks the opinion of the household head about the household's standard of living, including questions about satisfaction with life.

The measure of overall welfare is provided by answers to the *SWL* question (Section 2). The majority of the sample were not satisfied with their lives; 62.5% answered either (1) or (2) (24.4% gave (1)). Slightly less than one-quarter were satisfied; 18.3% gave (4) as their answer and 5.6% gave (5). (The remainder, 13.6%, reported that they were neither unsatisfied nor satisfied.) These numbers indicate a much lower level of satisfaction with life than found in Western Europe where 80-90% of the population report that they are satisfied with their lives when asked the same question in surveys (Delhey, 2004), as compared to one-quarter in Malawi.

While *SWL* is the natural choice for identifying a measure of utility, how should we measure economic welfare, as one argument of utility? Ravallion and Lokshin used alternative objective and subjective measures. The most widely-used objective measure of economic welfare in developing countries is consumption expenditure per person (*C*) given by total household expenditure, including spending on food (purchased and home-produced and food received as gifts), non-food items, estimated flow of services from consumer durables and actual or self-estimated rental cost of housing.²⁵ Although this is a comprehensive consumption aggregate, there are well-known concerns about how well it reflects welfare, even when this is thought of as the narrower concept of 'economic welfare.'²⁶ In that light, one cannot rule out the possibility that the results obtained using consumption as the measure of economic welfare will be biased by correlations between the perceived economic welfare of friends and neighbors and the errors in measuring own welfare using consumption.

²⁵ For details on how the consumption aggregate was formed see World Bank (2005b).

²⁶ On the identification problem in consumer demand-based measures see Pollak (1991). Slesnick (1998) surveys alternative empirical approaches. Subjective welfare measures have been seen as a promising route to avoiding the identification problems in deriving a metric of welfare from observed demand behavior; for overviews of this approach see van Praag (1991) and Kapteyn (1994).

For these reasons, Ravallion and Lokshin also used self-assessed economic welfare, based on the own-economic welfare (*OEW*) question in which respondents are asked: “Imagine six steps, where on the bottom, the first step, stand the poorest people, and on the highest step, the sixth, stand the rich (show a picture of the steps). On which step are you today?”

One also needs measures of the economic welfare of relevant groups for social comparison or risk sharing. People in geographic proximity to the respondent are an obvious source of comparators, co-insurers and help in other ways, such as finding employment. Following past practice in the literature, we can use the geographic structure of the sample design to estimate mean consumption of neighbors by mean consumption of all sampled households in the respondent’s EA, excluding the respondent.

As noted above, it is not clear that this provides a good measure of the economic welfare of neighbors. However, there is an additional source of information for studying social effects (that appears to have been largely ignored in the literature), namely to ask survey respondents about their comparison groups. Ravallion and Lokshin used questions asking people about how they perceive the economic welfare of the two most obvious comparison groups: friends and neighbors. (Workplace comparisons are another possibility, but these are of limited relevance in a poor, largely rural, country such as Malawi.) It is left to the respondent to judge who are their friends and neighbors, and by what standard their economic status is to be judged. With regard to the respondent’s friends, Ravallion and Lokshin use the friends’ economic welfare (*FEW*) question: “Imagine six steps, where on the bottom, the first step, stand the poorest people, and on the highest step, the sixth, stand the rich: (show a picture of the steps). On which step are most of your friends today?” The same question is asked about neighbors’ economic welfare (*NEW*). The unobserved measure of utility takes the form:

$$u_i = \alpha OEW_i + \beta^F FEW_i + \beta^N NEW_i + \gamma^F OEW_i FEW_i + \gamma^N OEW_i NEW_i + \delta FEW_i NEW_i + \pi X_i + \varepsilon_i \quad (10)$$

The answers to the SWL question are then interpreted as ordinal responses from this latent continuous variable, and the model is estimated as a Ordered Probit (OP) (assuming that the error term in (10) is normally distributed).

The results of the tests using objectively assessed consumption of neighbors indicate a positive effect of neighbors’ consumption for the bulk of the data. However, this effect declines as own-consumption rises (a negative interaction effect), consistent with Case 3 in section 2.

Using the specification that gave the most precise estimates, the neighborhood consumption effect is positive for 79% of data points. However, SWL increases with own consumption over the entire range of consumptions found in the data. On splitting the sample between rural and urban areas they also found marked differences. The external effect of neighbors' consumption and its negative interaction effect with own-consumption remain strong in rural areas, but they are only evident in urban areas when one includes geographic dummy variables. In that case one finds that the negative external effect dominates; indeed, the effect of neighbors' consumption is negative for the entire urban sample. By interpretation, RD is the weaker social effect in rural areas, but the dominant one in urban areas.

These results are broadly confirmed using the respondents' own assessments of the welfare of their friends and neighbors. For the (self-assessed) poor, the results are clearly inconsistent with the implications of relative deprivation theory. However, signs of a negative gradient with respect to neighbor's economic welfare emerge at the upper rungs of the own-welfare ladder. Amongst those who feel that they have poor neighbors, having well-off friends results in higher mean SWL. This gradient is more robust as one moves up the *NEW* ladder.

The estimates of equation (10) suggest that RD does emerge as a concern among middle and relatively well-off groups. To help interpret the implications for welfare-consistent poverty lines for Malawi, I shall extend the analysis of Ravallion and Lokshin by using their econometric estimates of (10) to derive the iso-welfare contours (indifference curves), as obtained by calculating the critical value of *OEW* needed to compensate for differences in *FEW* and *NEW*, while holding the expected value of utility constant. This can be interpreted as the utility-consistent poverty line in the space of economic welfare corresponding to a fixed reference utility level (the poverty line in the space of utility). When RD is the dominant social effect, the utility consistent poverty line will rise with comparison group economic welfare. However, this switches when the positive externality is dominant. Fixing the expected value of utility at u^* one solves for:²⁷

$$OEW_i^* = \frac{u^* - \beta^F FEW_i - \beta^N NEW_i - \pi X_i}{\alpha + \gamma^F FEW_i + \gamma^N NEW_i} \quad (11)$$

²⁷ I set $\delta = 0$ in equation (11) consistently with the empirical results of Ravallion and Lokshin (2007). Note that OEW^* is a continuous variable, unlike *OEW*.

Table 1 provides the values of OEW^* at mean points for X and for two reference utility levels (as defined by the middle two cut-off points from the Ordered Probits reported in Ravallion and Lokshin (2007)). The proportion of the population reporting that they are below the lower of these two cut-off points (i.e., that they are either ‘very unsatisfied’ or ‘unsatisfied’) corresponds closely to prevailing estimates of the poverty rate for Malawi.

Table 1: Poverty lines for own-economic welfare in Malawi holding utility constant

		Neighbors (<i>NEW</i>)				
		1 (poorest)	2	3	4	5
(a) At the boundary between “unsatisfied” and “neither unsatisfied nor satisfied”						
Friends (<i>FEW</i>)	1 (poorest)	2.88	2.85	2.82	2.78	2.74
	2	2.82	2.79	2.75	2.70	2.64
	3	2.76	2.72	2.66	2.60	2.53
	4	2.68	2.62	2.56	2.47	2.36
	5	2.58	2.50	2.41	2.29	2.13
(b) At the boundary between “neither unsatisfied nor satisfied” and “satisfied”						
<i>FEW</i>	1 (poorest)	4.01	4.05	4.11	4.17	4.24
	2	4.06	4.12	4.18	4.26	4.35
	3	4.13	4.20	4.27	4.37	4.48
	4	4.21	4.29	4.39	4.51	4.67
	5	4.31	4.42	4.55	4.72	4.93

Note: The table gives the value OEW^* needed to compensate for each (*NEW*, *FEW*) combination holding the expected value of utility constant. Controls set to mean points.

Source: Author’s calculations for this paper.

Focusing first on panel (a) in Table 1, one finds that for u^* at the estimated cut-off point below which one is either ‘very unsatisfied’ or ‘unsatisfied,’ the value of OEW^* tends to fall as *FEW* rises (at given *NEW*) and similarly OEW^* falls as *NEW* rises (at given *FEW*). This pattern reflects the positive utility gains from having better off friends and neighbors. However, the pattern reverses when one shifts to the higher reference utility level (panel b), when the RD effect kicks in. Then the poverty lines in the space of perceived economic welfare start to look like relative poverty lines. However, note that in all cases in Table 1, the gradients in OEW^* are small; to the nearest ladder rung, the poverty line is at $OEW^* = 3$ for 80% of cases in panel (a) and it is $OEW^* = 4$ for 80% of cases in panel (b).

6. Conclusions

A relative poverty line that rises with mean income of a country or region makes sense as a money metric of welfare if poor people experience relative deprivation—a negative externality from living in a well-off place. Yet other theories in development economics point instead to positive external effects arising from institutions for risk sharing, the provision of local-public goods, local employment opportunities or productivity-enhancing spillovers.

Taking risk sharing as the source of positive externalities, I have identified conditions under which relative deprivation will dominate the gains from risk sharing. If full risk sharing is attainable then the positive effect of an increase in the community's mean income will always dominate relative deprivation. With partial risk sharing (constrained by the need to avoid defection from the co-insurance group) the outcome is unclear. Under certain conditions, the positive external effect will tend to be the dominant factor for the poor, while relative deprivation will emerge at high incomes. The outcome is an empirical question.

In marked contrast to past empirical work for developed countries, the results discussed here for Malawi do not suggest that economic disparities relative to friends and neighbors are a welfare-relevant concern for most people, and certainly not for the poor. Neither objective nor subjective measures of economic welfare reveal any sign of relative deprivation effects for poor people. Indeed, most specifications tested indicate significant positive external effects for the bulk of the data, although these effects are largely confined to rural areas. However, the empirical results do indicate the existence of a negative interaction effect between friends' economic welfare and own own-economic welfare in rural areas. Thus, relative deprivation does emerge as a concern amongst the relatively well-off within this (poor) country.

The evidence presented here offers little support for the idea implied by relative deprivation theory of a poverty line that rises with the mean income of the comparison group. Indeed, the results suggest the opposite property; for the bulk of the sampled households, the utility-consistent poverty line would actually fall as the comparison-group income increases although my quantitative estimates do not suggest much gradient. However, the evidence for Malawi is consistent with the idea that relative poverty will be more salient as the economy becomes more urbanized.

These results offer support on welfarist grounds for the emphasis given to absolute level of living in development policy discussions. However, the results also suggest that relative

deprivation can be found even in poor but unequal countries, and that it is likely to become more important as such countries develop. It could well be that future measurement practices even in developing countries will need to be more relativist, if they are to be consistent with perceptions of welfare on the ground.

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